

WHAT IS CLAIMED IS:

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1 1. A method of scanning a field of view of an imager across a field of regard using
2 a scan mirror mounted on a gimbal having an inner axis and an outer axis, the method
3 comprising:

4 sweeping the field of view across the field of regard in a selected direction by
5 rotating the gimbal about the inner axis while maintaining the gimbal at a fixed angle with
6 respect the outer axis so as to;

7 progressing to a subsequent scan position by rotating the gimbal about the outer
8 axis by a predetermined increment angle while maintaining the gimbal at a fixed angle
9 with respect the inner axis;

10 repeating the act of sweeping such that the selected direction is chosen alternately
11 from a first direction and a second direction that is opposed to the first direction; and

12 repeating the act of progressing prior to each repeated act of sweeping;

13 wherein there is substantially no rotation, with respect to the instantaneous
14 direction of scan, of an image formed on the imager.

1 2. An apparatus for scanning a two dimensional field of regard, the apparatus
2 comprising:

3 a telescope having a focal plane and a field of view;

4 one or more image sensors disposed at the focal plane;

5 a single optically flat mirror disposed in the object space of the telescope;

6 wherein the flat mirror scans the field of view across the field of regard while
7 maintaining a fixed relationship between the rotational direction of scan and the projection
8 of the telescope's focal plane.

1 3. The apparatus of claim 2, wherein the image sensors are configured to perform
2 time delay and integration imaging.

1 4. The apparatus of claim 2, wherein the image sensors are configured to perform
2 multi-spectral imaging.

1 5. The apparatus of claim 2, wherein the image sensors are configured to perform
2 hyperspectral imaging.

1 6. The apparatus of claim 2, further comprising:
2 a gimbal having an inner axis and an outer axis, the flat mirror being mounted on
3 the gimbal;
4 wherein the field of view covers the two dimensional field of regard via a series of
5 conical arcs, each arc being scanned by rotation about the inner axis of the gimbal.

1 7. The apparatus of claim 6, wherein an active scanning portion of each conical
2 arc is separated from an active scanning portion of the subsequent conical arc by a brief
3 vertical deflection interval.

1 8. The apparatus of claim 7, wherein rotation about the outer axis of the gimbal is
2 stepped during the vertical deflection interval.

1 9. The apparatus of claim 7, wherein rotation about the outer axis of the gimbal is
2 constant during the active scanning portion.

1 10. The apparatus of claim 7, wherein rotation about the inner axis of the gimbal
2 remains substantially constant during the vertical deflection interval.

1 11. The apparatus of claim 7, wherein rotation about the inner axis of the gimbal
2 slews the scan back to a starting position during vertical deflection interval .

1 12. The apparatus of claim 2, wherein each conical arc is scanned at a constant
2 angular velocity throughout the arc.

3 13. An apparatus for imaging a two dimensional field of regard, the apparatus
4 comprising:

5 an imager having a field of view along a line of sight, the field of view being
6 substantially smaller than the field of regard;

7 a scan mirror disposed so as to cast the line of sight onto the field of regard;

wherein the scan mirror causes the line of sight to be scanned across the field of
regard in a conical arc.